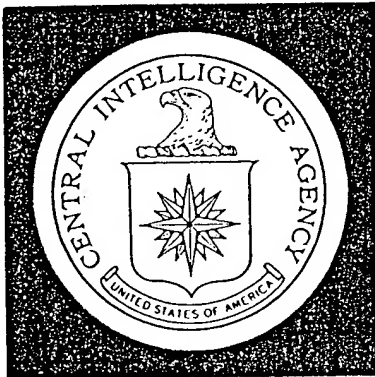


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DIRECTORATE OF
INTELLIGENCE

Intelligence Report

*Potential for Soviet Trade with the United States
in Industrial Raw Materials*

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December 1971

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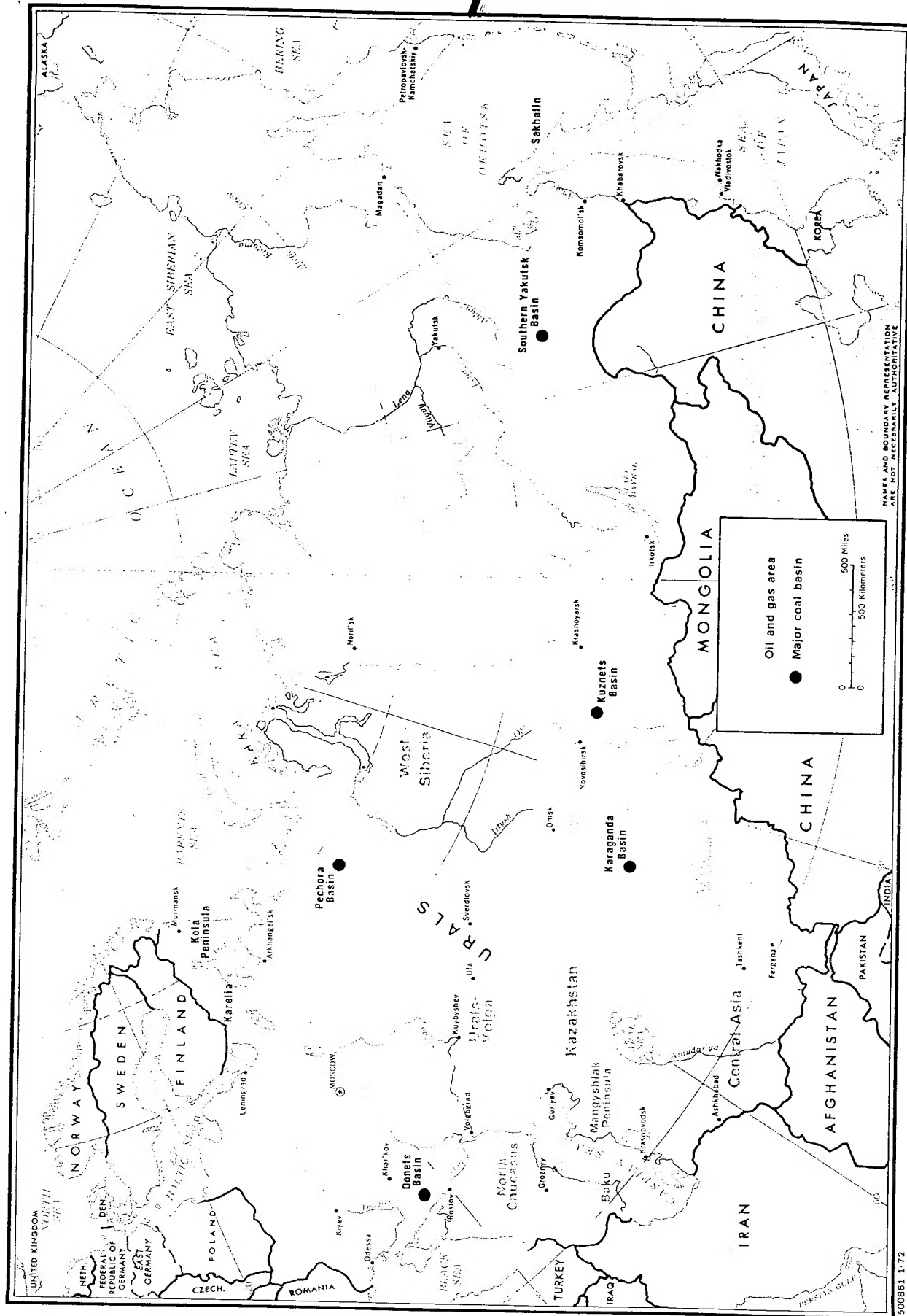
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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
December 1971

INTELLIGENCE REPORT

POTENTIAL FOR SOVIET TRADE WITH THE UNITED STATES
IN INDUSTRIAL RAW MATERIALS

Highlights

1. Premier A.N. Kosygin recently proposed that US firms participate with the USSR in the exploitation of Soviet raw material resources such as copper, crude oil and natural gas, diamonds, manganese, phosphates, timber, and titanium. US firms would supply mining equipment and services and be repaid in the product of the venture. Kosygin's proposal reflects a Soviet desire to develop its mineral and timber resources to meet export commitments to the Communist countries of Eastern Europe, which are heavily dependent on the USSR for many raw materials, and to provide saleable items to the West to earn foreign exchange.

2. The Soviets will need several billion dollars of foreign investment capital over the next decade to develop mineral and timber resources if they are to do so without compromising other high priority objectives. Although the USSR has the capability to develop most of its resources on its own, there are heavy competing demands on available manpower and machinery production capacity. Also, in some areas, the USSR prefers US (or other foreign) equipment because of its superior technical qualities. The USSR is unable to make cash purchases of US equipment and services on the scale needed, however, because of a scarcity of foreign exchange.

3. The prospects in 1972-75 for an increased exchange of US equipment and technology for Soviet industrial raw materials are good for crude oil and natural gas; possible, but less likely, for copper, diamonds, manganese, nickel, and timber; and poor for coal, iron ore, phosphates, and titanium.

Note: This report was prepared by the Office of Economic Research. Because research was completed by the time the official reports concerning the visit of Secretary Stans to the USSR were distributed, the present report is confined to discussion of trade prospects in areas suggested by Premier Kosygin and other Soviet officials at earlier dates. Thus no attention is given in this report to several additional materials which Premier Kosygin briefly mentioned to Secretary Stans as possible resources for development, including a "little tin, zinc, rare earths, and high-purity metals."

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4. Prospects are good for crude oil and natural gas because the USSR urgently needs modern petroleum facilities and has shown a strong interest in US equipment and technology, generally the most advanced in the industrial West. Moreover, Soviet oil and natural gas probably can be marketed in the United States or elsewhere.

5. Prospects are mediocre for copper and manganese because, for the next few years at least, non-Soviet supplies of these minerals will be ample to meet US and other world demand without a marked rise in prices. Some trade in copper could develop after 1975, however, if, as seems likely, it becomes necessary to mine lower grade ores in the United States and elsewhere to meet growing US demand. In the latter half of the 1970s, some trade in manganese also is possible because the United States is almost wholly dependent on imports. Nevertheless, Soviet terms would have to be especially favorable to compete with well-established sources of supply in Brazil and Gabon.

6. The United States has imported small amounts of nickel from the USSR in recent years and will increase such imports under the terms of a contract providing for annual deliveries by the USSR of 5,000 tons of nickel to the US Steel Corporation for the next five years. Prospects are only fair, however, for any further increase in nickel trade in the next several years.

7. Prospects for timber are slight because the USSR probably would not be willing to sell timber products at prices competitive with those in Canada. US firms, however, might be willing to participate in a joint development project and to accept some timber products for marketing in the United Kingdom or Western Europe. These countries have been relatively large importers of timber products (mostly lumber) from the USSR for several years.

8. The prospects for large-scale imports of Soviet diamonds also appear slight because the marketing of diamonds in the United States is tightly controlled by the deBeers cartel. It is unlikely that US diamond distributors would be willing to absorb a significant increase in the current relatively low level of diamond imports outside of the established marketing network of the deBeers cartel.

9. The outlook for trade in coking coal, phosphates, iron ore, and titanium seems especially poor. Supplies of coking coal will be plentiful in world markets at relatively low prices during the next decade. Moreover, the United States, which produces the highest quality coking coal in the world, is a major exporter. In the case of phosphates, both the United States and the USSR are major exporters and hence are competitors. The

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USSR has cut into US European markets to some extent, and, if US firms help the USSR to develop phosphate deposits in the Eastern regions, Soviet phosphates might cut into the US share of the large Japanese market. The United States is dependent on imports of iron ore for about one-third of its requirements but is not likely soon to need Soviet iron ore to supplement more reliable sources of supply in nearby Canada and South America. The United States has imported small amounts of titanium from the USSR, but US demand for titanium has fallen off sharply with the cessation of the supersonic transport program.

10. For two other commodity groups, chrome ore and platinum-group metals, the USSR already is a major supplier to the United States. Although a continuation of substantial trade is likely, the USSR has shown no interest in obtaining US or other help from the industrial West to expand production.

11. In the period of the late 1970s and beyond, the outlook for trade with the USSR probably is brighter. The United States probably will be obliged to increase its reliance on foreign suppliers of raw materials as the economy continues to grow. The USSR, with its extensive resources in many of these materials, could become a potentially important supplier to US and other Western markets. Assuming continuation of the East-West detente, the convergent interests of the two countries would seem to make likely a significant increase in trade. For example, the USSR might supply copper and increasing quantities of other nonferrous metals to meet growing US demand.

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Discussion

Introduction

12. The USSR recently has shown high-level interest in expanding Soviet-US trade and in obtaining US assistance in developing Soviet mineral and timber resources. Premier A.N. Kosygin, speaking to a group of prominent US citizens who had attended the Sixth "Dartmouth Conference"⁽¹⁾ in Kiev in July 1971, urged the removal of US restrictions on trade with the USSR and called for the development of other forms of economic cooperation. In particular, he encouraged exchanges of technology and licensing and mentioned the possibility of joint efforts in the exploration of the continental shelf and in development of Soviet raw materials such as copper, crude oil and natural gas, diamonds, manganese, phosphates, timber, and titanium. He suggested that US companies participate in the planning of development projects, supply equipment and services, and be repaid in the product of the venture. As precedent, Kosygin noted current Japanese participation in development of timber resources in the Soviet Far East in exchange for timber, and the exchange of Soviet natural gas for steel pipe produced in West Germany. He also observed that the USSR is studying the possibility of some similar arrangement for supplying oil to Western countries. These suggestions were repeated by Kosygin in his recent discussions with Secretary Stans in Moscow.

13. This report examines the prospects for trade in the commodity groups suggested by Kosygin or other Soviet officials and in two additional commodities -- chrome ore and platinum-group metals -- currently being exported to the United States by the USSR (see Table 1). Special attention is given to the likelihood of joint efforts and credit compensation arrangements under which US suppliers would extend credit to the USSR and be repaid partly or wholly in goods produced from the equipment, technology, or other assistance provided on credit. These prospects are considered both for the remaining years of the Soviet Ninth Five-Year Plan (1971-75) -- the "short-term" -- and for more distant years -- the "longer term." Detailed discussion of each of the resources is contained in the Appendix.

Soviet Need for Foreign Assistance

14. The USSR possesses extensive mineral deposits and timber resources. Many of the richest deposits, however, are underdeveloped and are located in the regions of Western and Eastern Siberia and in the Soviet

1. A conference of leading US and Soviet citizens that meets occasionally to discuss informally matters of mutual interest.

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Table 1

USSR: Production and Exports of Industrial Raw Materials
to the United States, Western Europe, and Japan, 1970

	Units	Production	Total	Exports		
				United States	Western Europe	Japan
Chrome ore	Thousand metric tons	3,000.0	1,180.0 a/	410.0	411.0	124.0
Coal, coking	Million metric tons	120.0	9.0	--	1.3	2.9
Copper	Thousand metric tons	1,100.0	123.1	--	19.3	--
Crude oil	Million metric tons	349.6	95.8 b/	0.2	37.5	2.8
Diamonds	Million carats	2.6	167 c/	11	156	--
Iron ore	Million metric tons	195.5	36.1	--	3.1	1.3
Manganese ore	Thousand metric tons	6,100.0	1,228.0	--	296.0	96.0
Natural gas	Billion cubic meters	198.3	3.3	--	1.0	--
Nickel	Thousand metric tons	140.0	19.3	0.8	13.9	4.6
Phosphates	Million metric tons	18.0	5.6 d/	--	2.0	--
Platinum-group metals	Thousand troy ounces	2,100.0	1,788.1	494.4	552.3	711.3
Timber products						
Logs	Million cubic meters	298.0	15.3	--	4.6	7.0
Lumber	Billion board feet	48.3	3.4	--	1.5	--
Paper and paper-board	Thousand metric tons	6,679.0	721.6	--	27.9	2.4
Titanium	Thousand metric tons	19.0	5.0	0.9	1.0	1.5

a. Includes some ores lower than metallurgical grade.

b. Includes oil products as well as crude oil.

c. 1969 data; million US \$.

d. Apatite concentrates.

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Far East where severe climate and poorly developed or nonexistent infrastructure present unusually difficult problems of exploitation. West Siberian oil and gas deposits appear, on the basis of limited exploratory drilling, to be of excellent quality. The crude oil, for the most part, has a low sulfur content, less than 1%, and the gas is low in corrosive properties and contains a high percentage of methane. Similarly, the Soviets claim that the undeveloped Yakutsk coking coal deposits are of good quality and are low in sulfur content. Chrome ore deposits in Kazakhstan, among the richest in the world, contain an abundance of premium-grade ore that is highly prized in the United States for metallurgical applications. The undeveloped copper deposits at Udokan in Siberia are apparently of a higher quality than most deposits being exploited commercially in the United States. Also, the quality of existing deposits bearing platinum-group metals, and of the platinum deposits as yet undeveloped at Talnakh (near Noril'sk), is believed to be high. Deposits of iron ore, however, are only of average quality, and manganese, nickel, and titanium deposits are of questionable quality. More than one-third of the phosphate rock in the USSR is suitable for processing into high-grade concentrates; most of the remainder is lower grade sedimentary phosphorite. Probable locations of the deposits that the Soviets intend to exploit are shown in the map insets in the Appendix.

15. For some of these resources -- most importantly crude oil and natural gas -- the need to develop new deposits to meet currently planned production goals for the first half of the 1970s is urgent. Moreover, if these deposits are to be developed on schedule, modern petroleum equipment and technology must be acquired from the West. In the case of other minerals -- for example, copper -- the need to develop new deposits is less urgent, but, because of the long lead times before production, development should get under way soon if new sources of supply are desired by the late 1970s. Foreign assistance is desired for these projects because capacity and technological limitations in many areas of the domestic machine building industry would make it very difficult for the USSR to provide adequate support to a broadly-based and economical exploration and mining program in the 1970s without seriously disrupting other high-priority programs. However, limitations exist on the amount of credit the USSR can use to obtain such assistance. The USSR owes the West about \$2 billion. Debt service now takes up about 20% of its export earnings from the West, and continued use of Western credit at the current rate might soon boost this percentage to a point beyond which the USSR would not be willing to go.

16. By accelerating the development of its mineral resources, the USSR probably hopes to achieve several objectives: provide for the long-range needs of the Soviet economy; meet export commitments to the

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Communist countries of Eastern Europe, which are heavily dependent on the USSR for many raw materials; and finally, provide for future surpluses that can be sold in the West for hard currency.

Scale and Type of Investments Needed

17. The USSR is seeking help from the industrial West on a very large scale. Although the total dollar value of the foreign investment sought is not known, it could total several billion dollars by the end of the decade. Estimates of the potential value of foreign investment made by US and third country firms for selected raw materials are as follows: natural gas, \$1 billion⁽²⁾, crude oil, \$500 million initially and up to \$500 million annually for the following few years; copper, \$1 billion to \$2 billion; nickel, \$70 million to \$100 million; and timber, at least \$350 million.

18. In general, if a special form of barter payment – including credits and repayments in commodities – known as "credit compensation" trading, can be arranged, the USSR likely would purchase a wide range of mining, processing, beneficiating, and transport equipment for development of the resources considered in this report. Probably the USSR will supply the equipment for developing the supporting infrastructure (roads, housing, power, auxiliary services), but it may ask for foreign investments in this area as well. Finally, because planned Soviet mining operations are large, complex, and technologically demanding, it is likely that the USSR also will seek foreign management and engineering expertise.

19. A full shopping list is not available for specific types of equipment and technology desired by the USSR from US and other Western suppliers to help develop the resources mentioned by Kosygin. However, a useful indication of the scale and diversity of possible Soviet investment needs for crude oil and natural gas equipment and technology is given below (see paragraphs 24-28).

Trade or Joint Ventures

20. Trade between the United States and the USSR in industrial raw materials can take one of several forms; the direct sale of Soviet raw materials to the United States for cash is the traditional method. For several years the United States has been purchasing chrome ore and platinum-group metals (mainly palladium) from the USSR in this manner. Probably this trade will continue and even grow moderately during the next several years. A reverse flow of US raw materials to the USSR is unlikely.

2. Excluding facilities for export of liquefied natural gas, see paragraphs 36 and 37.

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21. A second method is the classic barter arrangement of a straight exchange of goods. If the US supplier of commodities or equipment is paid partly in cash and partly in counter-deliveries of goods, the transaction is known as "compensation" trading.

Foreign Investment Needs for Oil and Natural Gas --
Summary of a Case Study

24. Soviet needs for the oil industry are large and include all phases of oil exploration, drilling, extraction, and processing. For exploration, the USSR needs digital recording field units for the collection of seismic information, computer playback centers for processing large amounts of seismic data, formation testers, core barrels and bits, and formation logging tools to improve Soviet procedures for assessing underground reservoir conditions. For production, the USSR needs rotary drilling rigs, drill pipe, drill bits, blowout preventers, mud pumps, down-hole tools, and cementing equipment. Also, high-volume centrifugal and plunger-type pumps are needed for use in older producing fields, particularly in the Urals-Volga region, where water encroachment has become a serious problem. For processing, the USSR needs technology and equipment to remove water and salt from crude oil before it is transported to refineries and secondary refining facilities to improve the quality and diversity of Soviet oil products.

25. The most pressing need of the Soviet gas industry is for large-diameter pipeline systems. During 1971-75, the USSR plans to construct 57,000 kilometers of pipelines (mostly large-diameter, 48 and 56 inches) -- 30,000 kilometers for natural gas transport and 27,000 kilometers for oil. This ambitious plan will require at least 16 million tons of pipe. Currently planned imports and domestic production will provide about 10 million tons, leaving a shortfall of about 6 million tons.

26. During the 1970s the technology and equipment needs of the Soviet gas industry will intensify as production expands in West Siberia and Central Asia. Demand for high-pressure well-head equipment, valves, drill pipe, and other types of producing equipment will grow rapidly. In addition, each of the several gas producing regions has specialized requirements. In the older gas fields in the European part of the country, compressors and water-flood equipment are needed to maintain pressure in the reservoirs. In Central Asia, production equipment must be manufactured from special alloy steels to prevent corrosion in fields that contain sizable amounts of sulfur and carbon dioxide. In Siberia, forged steel well-head fittings and ball valves made from high-strength steel alloys will be required in large number to ensure reliable operation of the equipment under permafrost conditions. Also, to facilitate drilling in permafrost, special drilling fluids and insulated casings, or the use of casing

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with refrigerants and slip-joints to reduce the possibility of ground thaw around the well bore and loss of a well, will be needed. In the northern regions of West Siberia, other specialized equipment of a type not now available in the USSR will be required to remove gas hydrates and condensates from polar gas well streams. Moreover, if, as expected, crude oil is found beneath the gas-producing strata in several of the largest fields, multizone producing equipment will be needed. Soviet oilmen have had only limited experience with such equipment, which is in very short supply in the USSR.

27. The lack of hermetically-sealed casing joints and of adequate well-head equipment and gas collecting and processing equipment causes the USSR to lose a huge volume of associated gas annually. In 1970, 12 billion cubic meters (cu.m.) of gas, valued at about 300 million rubles, were flared at the oil wells.⁽³⁾ Clearly, the USSR urgently needs equipment to collect and process the associated gas. The dry gas that is recovered can be recycled into the formation, thus increasing the producing life of the oilfield, or collected and shipped via pipeline for consumption as fuel. Gas processing equipment also can provide for the recovery of liquids that can be used as raw material for the chemical industry.⁽⁴⁾

28. Equipment for liquefying natural gas and for storing and transporting the liquefied gas, although not essential to development of Soviet natural gas resources, will be required if, as in a proposal now under discussion, gas is to be exported to overseas markets.

Prospects for Trade in Selected Raw Materials

29. The prospects for expanded sales of mining equipment and technology to the USSR, or for direct US participation in Soviet mining ventures, very largely depend on the willingness of US companies to take payment in raw materials. US companies will be motivated to accept Soviet raw materials if they are marketable in the United States or in third countries and if the Soviet terms will provide a better return on investment than alternative opportunities in the non-Communist world.

30. A recent \$65 million deal concluded by the Soviet Ministry of Foreign Trade and the SATRA Corporation of New York, acting on behalf of several American companies, has given an initial impetus to expanded trade. Although specific details are not yet available, US firms will supply

3. This is more than was consumed in 1970 by Italy, one of the largest users of natural gas in Western Europe.

4. During the past two years, the USSR purchased gas processing equipment from France and Italy; it is now being installed.

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\$45 million worth of ore mining equipment, including dump trucks, cranes, and loaders, and \$20 million worth of tubular goods (drill pipe and tubing) and mud pumps for oil extraction, with payment in nickel.

31. Prospects for Soviet trade with the United States in industrial raw materials in the first half of the 1970s appear good for crude oil and natural gas⁵; possible, but less favorable, for copper, diamonds, manganese, and timber; and poor for coal, iron ore, phosphates, and titanium. An increase in trade in nickel is assured as a result of a contract negotiated with the US Steel Corporation for deliveries over a five-year period. Substantial trade already exists in chrome ore and platinum-group metals. (Current levels of US production and imports from major suppliers of these and the other commodities considered are shown in Table 2.) Because these minerals are in short supply in the United States, and because the USSR is a major supplier, such trade can be expected to continue at a substantial level in the future.

32. The outlook for US imports from the USSR is discussed in detail below. Unless otherwise indicated, the time frame refers to the period 1972-75.

Good Prospects (Crude Oil and Natural Gas)

33. The prospects for cooperation in the development of Soviet crude oil and natural gas resources are good because the USSR urgently needs modern petroleum facilities and has expressed strong interest in many kinds of US exploration, drilling, production, and pipeline equipment. Moreover, if the international oil companies can be persuaded to transport and process them, oil and natural gas can be taken in payment by US equipment suppliers for sale in the United States or elsewhere. The USSR may be willing to pay cash for small orders of equipment or technology, but for large transactions, credit arrangements and repayment by shipment of oil and gas would probably be required.

34. Petroleum equipment currently in use in the USSR for the extraction of oil and gas is technologically outdated compared with US equipment. Production methods are also backward. Soviet oil experts have acknowledged that the USSR must acquire modern equipment and introduce new methods if the Siberian areas are to become, as planned, the major source of petroleum in the USSR by 1980. These areas are crucial to maintaining the rate of growth of Soviet oil production. Thus increased

5. Although shipments of equipment from the United States to the USSR could take place before 1975, imports of Soviet natural gas are unlikely before the latter half of the 1970s.

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exports of oil to the West depend to a considerable extent on the acquisition of Western equipment and possibly on Western credit.

35. In the competition for up-to-date equipment sales, the United States has an advantage over Japan and Western Europe because US petroleum technology and equipment generally are the most advanced in the world. However, in the area of production of large-diameter pipe, third country competitors are abreast, and even ahead, of the United States. In other selected areas of oilfield equipment manufacture, other producers are rapidly approaching the US level of technology.

36. The USSR has sought the assistance of US companies in the construction of facilities for its natural gas industry in exchange for delivery to the United States of liquefied natural gas (LNG). Representatives of Tenneco and Texas Eastern Transmission Corporation, the two largest gas wholesalers in the United States, recently returned from the USSR where they conducted exploratory talks concerning a possible long-term agreement to import at least 2 billion cubic feet (56.6 million cubic meters) per day of Soviet LNG into the northeastern United States. Such an arrangement would involve investment of an estimated \$4 billion for pipelines, a liquefaction plant, and a ship terminal in the USSR; for some 20 LNG tankers; and for ship terminals, storage tanks, and regasification facilities in the United States.

37. The cost of delivering gas from Western Siberia by pipeline to an ice-free port in the European USSR should be somewhat less than the cost of delivering it to Western Europe, which the Soviets have contracted to do for around \$12 per thousand cubic meters (\$0.35 per thousand cubic feet). However, preliminary calculations by Tenneco and Texas Eastern indicated a price of \$0.50 per thousand cubic feet (\$17.65 per thousand cubic meters) f.o.b. a Soviet port. This price would be extremely profitable for the USSR. Conversely, the calculated cost of \$1.20 per thousand cubic feet landed in the United States is substantially higher than the proposed landed cost for LNG from Algeria (\$0.67 to \$0.84 per thousand cubic feet, depending on season and port of entry).

Mediocre Prospects

Copper

38. The USSR is not likely to export large amounts of copper to the United States or to other Western markets in the next several years for the following reasons: (1) The USSR probably will have only small quantities of copper available for export to non-Communist markets. The planned production of copper in the USSR during 1972-75 is geared mainly

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to meeting domestic and East European requirements. (2) World supplies of copper are expected to be adequate to meet the near-term needs of the United States and other Western countries at prices below the levels of the late 1960s.

39. Over the longer term the United States, Western Europe, and Japan are all potential markets for Soviet copper exports. US imports, mainly from Chile, Peru, and Canada, normally account for 20% to 25% of the refined copper consumed annually in the United States. In 1970 the United States imported 323,000 tons of copper. Western Europe, which used more than 2 million tons of refined copper in 1970, and also Japan depend almost entirely on imports to meet their needs. Demand for copper in all these countries will grow, while production in some non-Communist countries could be unfavorably affected by unsettled political conditions. Thus the long-term trend in the world copper market, though highly unpredictable, is likely to justify new as well as expanded sources of supply.

40. By the late 1970s the USSR may be in a position to export substantial quantities of copper to the industrial West if it is able to obtain foreign investment aid to develop the huge Siberian deposits at Udokan. For several years the USSR has been negotiating with firms in the United Kingdom, France, and Japan for help in developing the Udokan resources. More recently, the Soviets have expressed high-level interest in help from the United States.

41. US firms may be interested in participating in the development of the Udokan deposits, either in a consortium or as independent suppliers of equipment, if Soviet terms are sufficiently advantageous relative to the costs of developing lower-grade deposits in the United States and in other non-Communist countries.

Diamonds

42. Although the USSR is anxious to expand exports of gem diamonds, the prospects for US participation in the development of Soviet diamond deposits are uncertain. Premier Kosygin called for a joint Soviet-US venture, probably to exploit known deposits in the Yakutsk region, with payment in diamonds for US equipment and services. The United States is the world's largest market for gem diamonds, but most of the diamonds reaching the US market are handled through the deBeers cartel. If the venture were to involve deliveries of diamonds on a scale that would capture a sizable share of the US market, US distributors could be expected to offer strong resistance. Large sales of Soviet diamonds in the United States, outside of the established marketing network of the deBeers cartel, would threaten the maintenance of a firm retail price structure for gem diamonds.

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Limited US participation involving relatively small direct sales of Soviet gem diamonds probably would be feasible. The United States already imports a small amount of gem diamonds from the USSR.

Manganese

43. The near-term prospects for trade in manganese are mediocre to poor. An early increase is not likely in Soviet supplies available for export to non-Communist countries. Since 1966 production in the USSR has declined and exports have stabilized. Moreover, supplies of manganese on the world market seem adequate to meet the needs of the United States and other industrialized countries.

44. The long-term prospects for trade are uncertain. Potentially, the United States would appear to be a good market for substantial quantities of Soviet manganese. The United States is dependent on imports for virtually all of its manganese requirements, and US demand for manganese should increase as the output of steel expands. However, the following factors militate against any major Soviet penetration of the US market: (1) world supplies of manganese – principally from South Africa, India, Brazil, and Gabon – seem adequate to cover the needs of the United States and other industrialized countries for the indefinite future, (2) US firms have made substantial investments in Brazil and Gabon to ensure adequate future supplies, and (3) US firms may be reluctant to develop any significant dependency on Soviet supplies. The memory of Soviet actions at the time of the Korean War, when the USSR abruptly shut off deliveries of manganese to the United States, will be difficult to erase. Finally, as long as the USSR does not have most-favored-nation (MFN) status, the high tariff rate (about 35%) for non-MFN countries would discourage large-scale Soviet exports to the United States.

45. On the other hand, US firms may be interested in accepting ore in payment for a joint venture in the development of Soviet manganese deposits if the product could be marketed elsewhere in the West. Another consideration is the location of the deposits the Soviets intend to exploit. Deposits in the Soviet Far East would favor Japanese participation; deposits in the Ukraine might be attractive to US investors. In all cases, the Soviet terms would have to be generous to compare favorably with alternative investment opportunities in non-Communist countries.

Nickel

46. A significant increase in US imports of Soviet nickel is already scheduled as a result of the recent \$60 million contract signed between the US Steel Corporation and the USSR Ministry of Foreign Trade. The

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USSR will deliver 5,000 tons of nickel each year over a five-year period. In 1970, Soviet shipments of nickel to the United States amounted to about 800 tons, or less than 1% of total US nickel imports that year.

47. The prospects for a large expansion in trade in nickel between the United States and the USSR, beyond that negotiated with the US Steel Corporation, are uncertain. The United States is a large market for nickel -- imports account for about 90% of domestic consumption -- but currently demand is lagging and supplies are more than adequate. Although demand for nickel is expected to grow during 1972-75 as the tempo of economic activity picks up, the supply of nickel also is expected to keep pace. The International Nickel Company plans a large increase in its Canadian production, and major expansion of output is planned in New Caledonia and Guatemala. The other major nickel producers, Falconbridge of Canada and Le Nickel of France, also are adding new productive capacity.

48. Western Europe and Japan are also heavily dependent on imported nickel and are promising markets for the USSR. In 1969, Soviet sales on these markets were valued at about \$100 million. Apparently, the USSR envisions expanded sales to these markets. The USSR has been negotiating with the United Kingdom, France, and Japan for assistance in developing the Buruktal nickel deposits near Orsk in the Southern Urals and plans to repay foreign investors in nickel ore. This project also was recommended to Secretary Stans by Foreign Trade Minister Patolichev.

Timber

49. The prospects for timber also are uncertain. The US market does not appear to offer much opportunity for large Soviet sales. Traditional US ties to Canadian suppliers -- Canada supplies about 95% of US imports of major timber products annually -- coupled with the high cost of ocean shipping from the USSR to the United States, make it doubtful that Soviet timber products can be sold on the US market at prices competitive with those in Canada.⁽⁶⁾ The USSR may not be interested in negotiating a barter deal with the United States at prices that would make Soviet products competitive on the US market, because the USSR probably can sell its export surpluses at higher prices in Western Europe. Moreover, US firms enjoy no significant advantage over West European firms or Canada as suppliers of equipment for forestry development.

50. However, a US firm might be willing to participate in a joint development project and to accept some Soviet timber products for marketing in the United Kingdom or Western Europe. The United Kingdom in particular, which accounted for 11% of Soviet exports of timber products

6. The tariff on lumber for non-MFN countries is \$4 per thousand board feet. Currently, this is only about 4% of the f.o.b. price for lumber on the US West Coast. The MFN tariff on lumber, which is currently nominal, will be eliminated in 1972.

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in 1970, is a potentially promising market. Markets in the United Kingdom and Western Europe possibly could be expanded if the USSR is assisted in shifting from exports of lumber (in loose form) and logs to packaged wood and processed wood products, the demand for which is growing rapidly in all industrialized countries.

51. Japan, which accounted for about 18% of Soviet exports of timber products (mostly logs) in 1970, is also a growing and potentially large market for Soviet products. However, Japan is very active in its own behalf. An agreement for the joint exploitation of Soviet forests is already in force between the USSR and Japan. Japan is supplying machinery and equipment for a timber project in the Soviet Far East -- valued at about \$130 million -- and is taking out logs in payment. An additional agreement, valued at about \$350 million for wood-processing facilities, is currently being negotiated. Finally, a \$100 million pulp and paper project has been negotiated with France involving the exchange of French equipment for Soviet pulp, and discussions also are in progress between Finland and the USSR for forestry development projects.

Poor Prospects

Coal

52. The USSR is interested in foreign assistance for the development of large coking coal deposits in the Yakutsk region of Siberia. The prospects for US participation in a joint venture to develop those deposits, however, are poor. The United States has abundant supplies of high-quality coking coal and is a major exporter. Also the long distances involved suggest that Yakutsk coal could not be sold profitably in Western markets.

53. Japan represents the best potential market for Yakutsk coking coal, but, even here, prospects are not good. Coal delivered to Japan from these deposits probably would cost more than \$20 per ton and would face keen competition from Australian and Canadian coking coals (average c.i.f. prices in Japan for these coals were about \$15 and \$16, respectively, in 1970). The USSR has urged Japan to participate in the development of these deposits, but the capital requirement would be enormous -- \$1 billion to \$1.5 billion -- and Japan has thus far shown little interest. Moreover, Japan has long-term commitments to many suppliers in non-Communist countries. If the Japanese steel industry does not resume its very rapid growth rates of the 1960s, an international buyer's market for coking coal could develop, depressing market prices and further discouraging the development of large new sources of supply.

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Iron Ore

54. Little opportunity exists for trade in iron ore between the United States and the USSR in the period 1972-75. Supplies of iron ore on world markets are plentiful, reflecting the current sluggish tempo of the world steel industry. Moreover, the USSR, although it ranks as the world's largest producer of iron ore, uses nearly all its output to meet its own needs and those of Eastern Europe. Very little iron ore is exported to non-Communist countries; in 1970, about 4 million tons or about 2% of production went to Japan, the United Kingdom, Italy, and Austria.

55. The USSR, however, has shown considerable interest in the longer run in stepping up its exports of iron ore to non-Communist countries in return for their help in developing new deposits. Toward this end, the USSR has negotiated with the United Kingdom for the development of iron ore resources on the Kola Peninsula, and with Japan for the development of iron ore resources in the Soviet Far East. US firms might consider a joint venture in which iron ore is taken in payment because the United States depends on imports for about one-third of its iron ore requirements. However, the principal suppliers of the United States -- Canada and South America -- are closer and, because of relatively large differential in transportation charges, probably offer better investment opportunities. US firms have already invested in the development of iron ore resources in those countries, and, in addition, are now considering investments in potentially rich deposits in Brazil.

Phosphates

56. The prospects for Soviet-US trade in phosphates are poor. The United States and the USSR are both large and competitive exporters of phosphates. Soviet phosphate (apatite) exports already have cost the United States some markets in Scandinavia and may have kept the United States from making bigger sales in West Germany. In addition, the world phosphate market currently is characterized by excess capacity, intense competition, and relatively low prices. Indeed, world output virtually has stagnated since 1967, and large stocks have accumulated in Florida where most US phosphate is produced. Substantial increases in production are likely in the developing countries; Morocco and Tunisia are planning a significant expansion in production capacity, and Algeria, Egypt, Israel, and Jordan, are either expanding or planning to expand production. As a result, total supply probably will continue to exceed consumption, at least through 1975.

57. In the longer-run, West Germany and Japan -- both large importers of phosphate rock -- offer more favorable prospects for the sale

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of Soviet phosphates than does the US market. Accordingly, firms in those two countries may be willing to accept phosphates in payment for assistance to the USSR for the development of Soviet phosphate deposits. West Germany already has accepted some phosphate rock as partial payment for phosphorus furnaces exported to the USSR. On the other hand, US firms are not likely to be interested in a venture to develop Soviet resources for exports, thereby creating stiff competition for US exporters to these markets.

Titanium

58. The prospects for increased trade in titanium, or for a joint venture in the exploitation of Soviet titanium resources, are poor. With the cessation of the US supersonic transport program, and the slowdown in aerospace production generally, demand for titanium sponge (crude metal) in the United States has fallen off sharply. The United States has imported titanium sponge from several countries, including Japan, the United Kingdom, and the USSR, but, for the next several years, probably will have ample production capacity to meet its needs.

59. Capacity for the production of titanium in non-Communist countries is likely to be more than adequate to meet demand in the near future. Indeed, Japan and the United Kingdom may be forced to cut back production in reaction to the declining US demand. Nevertheless, titanium sponge may continue to be imported in small quantities by some US consumers, namely, independent fabricators. Customarily, independent fabricators have not depended on domestic producers and may continue to obtain whatever sponge they may need from their established foreign suppliers.

Other

Chrome Ore

60. The United States probably will continue to import large quantities of high-grade chrome ore from the USSR for the foreseeable future. Although the recent legislation to end the embargo on imports from Rhodesia may lead to an increase in supplies of chrome ore available to US consumers and ease the pressure on prices, the United States will remain dependent on the USSR for much of its chrome ore. Even prior to the imposition of Rhodesian sanctions, the USSR supplied 40% of the high-grade chrome ore imported by the United States. However, little likelihood exists that this trade will be expanded to include US assistance for the exploitation of Soviet chrome resources. The USSR seems to have provided for an orderly expansion of production at its major deposits in Kazakhstan (Khrom-Tau) and there is no evidence it either needs or wants US equipment and technology.

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Platinum-Group Metals⁽⁷⁾

61. Prospects are good for a continuing growth in the traditional trade between the United States and the USSR in platinum-group metals. In 1970, US imports from the USSR of metals in this group were valued at about \$23 million. These imports, expressed as a share of total US supply, varied widely by type of metal, ranging from about 46% of the supply of palladium and 15% of the supply of rhodium to only about 5% of the supply of platinum.

62. The USSR probably will continue to be the principal supplier of platinum-group metals on world markets because they constitute a major source of foreign exchange earnings for the USSR. In 1970, foreign exchange earnings from sales of these metals to non-Communist countries, including the United States, amounted to nearly \$100 million. As in the past, however, Soviet offerings of the metals may be restricted periodically and, in view of the limited availability from other sources, may result in an upward pressure on prices.

63. The USSR has shown no interest in obtaining US or other foreign participation in development of its resources of platinum-group metals. The USSR already enjoys a dominant supply position on world markets and probably is reluctant to join a venture that would commit it to deliveries of specified amounts of platinum-group metals at pre-determined prices. Moreover, the USSR probably does not wish to have US firms involved in activities in the Noril'sk region where most of the platinum-group metals are obtained as by-products in the mining of copper and nickel ores. Because of a longstanding Soviet reluctance to release production or capacity information on nonferrous metals, the Noril'sk Combine, probably the largest nonferrous metals producing center in the USSR, may be considered "off limits" to any sizable contingent of Western technicians.

7. Platinum, palladium, rhodium, iridium, osmium, and ruthenium.

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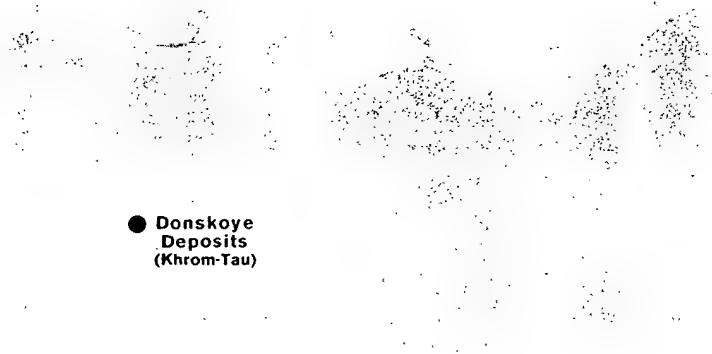
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Chrome Ore



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Resources

The USSR claims to have the world's largest reserves of chrome ore. Details to support this claim are lacking, but Soviet reserves undoubtedly are extensive. Most of the Soviet reserves are located in Kazakhstan. Additional reserves are in the Ukraine, Urals, Azerbajdzhan, and in the Far East. The Donskoye group of deposits near Khrom-Tau in Kazakhstan have the higher grade metallurgical ores of excellent quality, containing 30% to 60% chromic oxide with low silica and a chrome-to-iron ratio of as high as 4 to 1. Commercial ores, sold as fines, friable, and hard lumps, contain at least 45% chromic oxide and normally higher percentages.

Production

The USSR, the largest producer of chrome ore in the world, produced an estimated 3.0 million tons in 1970, or more than the combined total for South Africa and the Philippines, the next two largest producers. In contrast to the United States, which is dependent on imports for all of its supply (other than that drawn down from government stockpiles), Soviet output is adequate to meet all domestic needs and to leave a large surplus for export. Although production targets for the Ninth Five-Year Plan (1971-75) have not been announced, Soviet output of chrome ore probably will continue to expand during the next several years.

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Exports

The USSR is the world's largest exporter of chrome ore. Soviet exports have tripled during the past decade, rising from about 0.4 million tons in 1960 to 1.2 million tons in 1970. The USSR supplies a large share of the chrome ore requirements of the Communist countries of Eastern Europe, but more than 80% of total exports goes to non-Communist countries with the United States the principal recipient. In 1970, shipments to the United States amounted to 410,000 tons, with Western Europe and Japan receiving nearly all of the remainder of exports to non-Communist countries.

Market Conditions

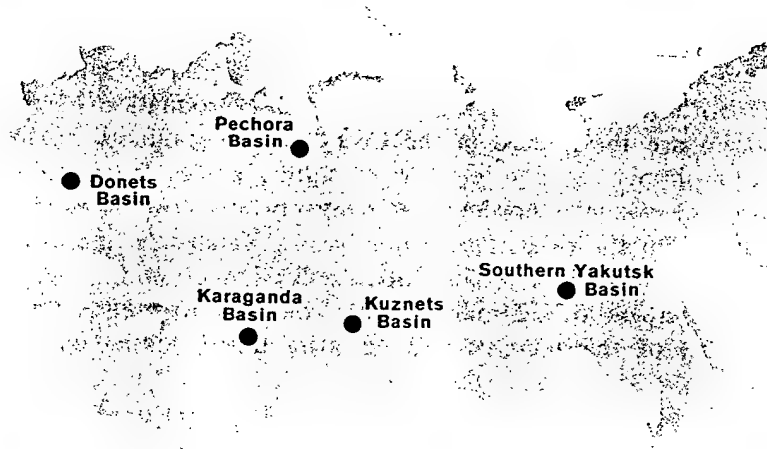
Chrome ore has been in tight supply in recent years. Following the imposition of the UN sanctions against Rhodesia, a leading world producer, chrome ore prices have risen steadily. The recent Congressional action to permit US firms to resume imports of chrome ore from Rhodesia should help to augment US supplies and to ease prices. However, the USSR, as the world's largest producer of high-quality metallurgical ore, will continue to be a major supplier to the United States, Western Europe, and Japan. Even prior to the Rhodesian sanctions, the USSR accounted for 40% of the US imports of such ore.

Soviet Interest in Foreign Assistance

The USSR, already established as the world's largest producer and exporter of chrome ore, has given no indication of any interest in obtaining US or other foreign assistance for further development of this resource.

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Coal



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Resources

The USSR claims that it has 6.8 trillion tons of coal reserves or more than half of the total world reserves. However, only 3% of the total Soviet reserves are in the "actual" or proved category; about 14% are "probable"; and about 83% are classified as "possible." A little more than one-tenth of Soviet claimed reserves are located in the developed Western regions, and the remainder, mostly low-grade bituminous or brown coal, is found east of the Urals. It has been estimated also that more than half of the Soviet coal reserves are located north of latitude 60° in permafrost soils.

The potential non-Communist markets for Soviet coal are limited mainly to coking coal. However, the USSR is not producing high-quality coking coal in any of its currently exploited deposits. Most of the coking coal deposits in the Western USSR are characterized by high sulfur content; reserves east of the Urals are largely either high-ash or high-phosphorus coals. One unexploited but potentially rich deposit of reportedly good-quality coking coal with a low sulfur content has been reported at Chul'man in the Yakutsk region of Eastern Siberia.

Production

In 1970 the USSR produced about 624 million tons of raw coal, including about 165 million tons of raw coking coal. Almost all of the coking coal has to be cleaned to reduce the ash and sulfur content to

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acceptable levels. Available clean coking coal amounted to 120 million tons in 1970. About 98% of the coking coal came from four major basins: Donets, in the Ukraine (51%); Kuznets, in West Siberia (29%); Karaganda, in Kazakh SSR (19%); and Pechora, in Northern European Russia (8%).

The Donets coal is relatively high in sulfur content (up to 4%) and has to be mixed with low-sulfur coals before use. Because the coal is mined at great depth from relatively thin coal seams, production costs in the Donets Basin are the highest in the USSR. The best-quality coking coal, high in phosphorus content but low in sulfur, comes from the Kuznets Basin, some of which is produced at relatively low cost by strip mining. Coking coal from the other two major basins, Karaganda and Pechora, is high in ash content, which is difficult to reduce by cleaning. Present plans call for an increase of 22 million tons from the Kuznets Basin during 1971-75. Most of this increase will be strip mined coking coal.

Exports

The USSR is not a major exporter of coking coal. In 1970, only about 9 million tons were shipped abroad, compared with 49 million tons for the United States. Exports were almost evenly split between Communist countries and the non-Communist world with about 60% of Soviet exports to the non-Communist world (2.9 million tons) going to Japan.

Market Conditions

Over the past decade, strains have developed in the world market for coking coal as a result of the phenomenal growth in demand by Japan for use in its burgeoning iron and steel industry. Japanese imports of coking coal increased dramatically from 4 million tons in 1960 to nearly 50 million tons in 1970. Excess production capacity in producing countries gradually was used up, and new mines were not commissioned in sufficient numbers to meet the sudden spurt in demand. This situation was brought home forcefully in the fall of 1970, when an acute shortage of coking coal for use in electric power generation in the United States led to demands for an embargo on US coal shipments to Japan.

During the past year, however, a general slackening in economic activity in the Western industrialized nations and a slump in the Japanese iron and steel industry combined to reverse the condition of the world coking coal market. Demand fell off significantly, and world stocks of coking coal rose.

The prospects for a more stable world market during the next several years are uncertain. A further step-up in supply seems assured as new mines are coming into production, and recently commissioned mines are reaching

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designed capacity. If, however, the Japanese iron and steel industry fails to resume its former rapid growth rates, intense competition in marketing the output of the newer mines could further depress world prices. Even with a faster tempo of production there will be some slackening in the rate of increase in consumption of coking coal in Japan as improvements in blast furnace technology yield further savings in coke consumption per ton of pig iron produced.

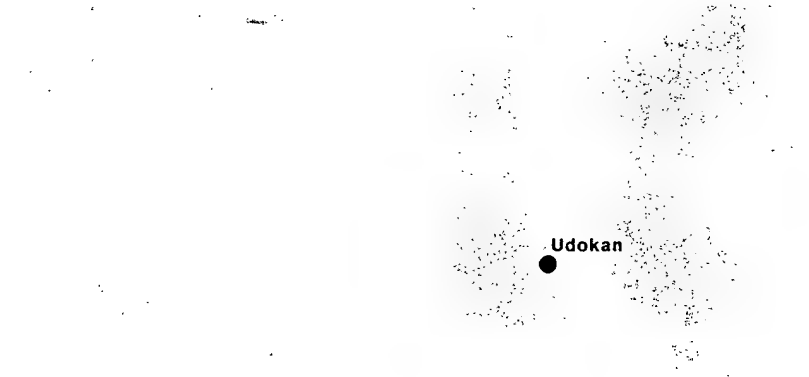
Soviet Interest in Foreign Assistance

The USSR has not sought US assistance for the development of coal reserves but has tried to obtain Japanese investment for the development of coking coal deposits in the Yakutsk area. The Japanese, who thus far have shown little interest, have estimated that the total capital requirements for such a project are "enormous" and would amount to \$1 billion to \$1.5 billion. Moreover, little precise information about the size and quality of the Yakutsk deposit is available, and an extensive preparatory drilling and prospecting program is required. Thus the lack of prospecting results, coupled with the very high investment requirements, makes it unlikely that any major foreign investment would take place before 1975, if at all.

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Copper



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Resources

The USSR claims to have the world's largest reserves of copper. Although up-to-date evidence is lacking to substantiate this claim, Soviet reserves undoubtedly are among the largest in the world. Available data indicate that measured reserves in the USSR at the end of 1965 amounted to more than 50 million tons of contained metal. While over the past six years proved reserves undoubtedly have increased somewhat, total reserves may not exceed the US level of about 80 million tons of contained metal.

The principal deposits currently being exploited are located in Kazakhstan. Other important deposits are found in the Urals, Central Asia, the Kola Peninsula, and the region near Noril'sk. However, the most notable deposit discovered in recent years is the giant Udokan ore body in the Transbaikalian region of East Siberia. The Udokan deposit, which the USSR alleges to be the largest single copper deposit in the world, reportedly has the potential to yield 400,000 tons of refined copper per year for over 50 years. The quality of the ore is said to be high, averaging 1-1/2% to 2% copper content. In the United States, commercially exploited ores often average considerably less in terms of copper content.

Production

The USSR has increased production of copper steadily in the past decade from about 0.5 million tons in 1960 to 1.1 million tons in 1970.

Soviet output in 1970 was the second largest in the world but still only about half the US total of 2.1 million tons. Nevertheless, current production is adequate to meet domestic needs and leave a surplus for export. Production is scheduled to increase by 35% to 40% during 1971-75.

Exports

During the 1950s and early 1960s, the USSR was a net importer of copper. Since 1965, however, annual net exports have ranged from 100,000 to 130,000 tons. The Communist countries of Eastern Europe continue to receive most of the copper exported by the USSR, but a few non-Communist countries import small quantities.

Market Conditions

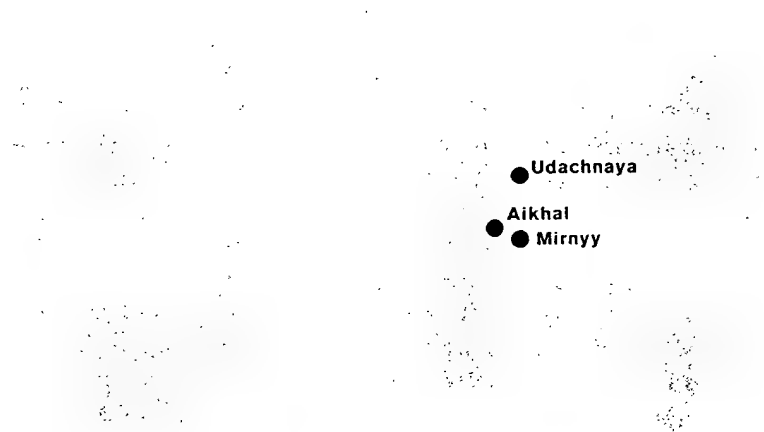
The immediate outlook for copper on world markets is one of generally adequate supplies, largely reflecting the lowered tempo of economic activity in the industrial West. As a result, world copper prices currently are considerably below the high levels reached during the period of tight supply in the late 1960s.

Over the longer term the demand for copper probably will increase steadily in developing as well as industrialized countries. The US Bureau of Mines estimates that, at current relative prices for copper and its close substitutes, demand for copper in the non-Communist countries beyond 1975 will increase at rates ranging from about 3% to 6%. Thus, in the long term, growth in world demand for copper could justify development of the Udokan deposits.

Soviet Interest in Foreign Assistance

The USSR has shown interest in obtaining foreign participation in a joint venture for development of its Udokan copper deposits. More specifically, Soviet officials have been negotiating since 1965 with Japanese, British, and French industrialists to work out a mutually satisfactory agreement. The negotiations have been extremely arduous because of the enormity of the project. Estimates of the total costs to develop the deposit range up to \$2 billion, a magnitude that suggests that only a consortium of interested companies would be able to mobilize the necessary capital. More recently, Premier Kosygin suggested US participation in this project.

Diamonds



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Resources

Prospected reserves of natural diamonds in the USSR are estimated at 200 million to 300 million carats, the second largest in the world after Zaire – formerly Congo (Kinshasa). The largest deposits are lode-type deposits in the Yakutsk region at Mirnyy, Aykhal, and Udachnaya. Small placer deposits also are found in Magadan Oblast and in Yakutsk.

The remote location of the deposits and severe climatic conditions have retarded exploitation efforts. Placer deposits are worked only during the summer months. Underground mining operations in the lode deposits in Yakutsk are carried on throughout the year, but related processing and support activities on the surface are hampered during the winter.

Production

The USSR ranks behind South Africa as the world's second largest producer of diamonds. Soviet production of natural diamonds has increased steadily since the latter 1950s and, in 1970, is estimated to have reached about 2.6 million carats of gem quality stones and more than 6.0 million carats of industrial stones. Soviet production is adequate to support domestic needs and a substantial export trade as well. Soviet plans for further expansion of production are not known.

Exports

The USSR exports both gem quality and industrial diamonds. Industrial diamonds are shipped to a large number of Communist and non-Communist countries, but, in terms of value, shipments are relatively small, amounting only to a few million dollars in recent years. Virtually all of the gem diamonds exported by the USSR are directed to the industrial West, with sales increasing sharply from \$25 million in 1965 to \$167 million in 1969. The United Kingdom received \$156 million of the total shipments in 1969, and the United States received the remaining \$11 million.

Soviet exports of gem diamonds to the United Kingdom are believed to be marketed in London through the central sales organization of deBeers, a cartel that controls about 80% of the total world supply of gem diamonds. By absorbing the Soviet diamonds, deBeers is able to control the supply and, in turn, the prices on non-Communist markets. A large share of Soviet diamonds probably is re-exported to the United States and Western Europe.

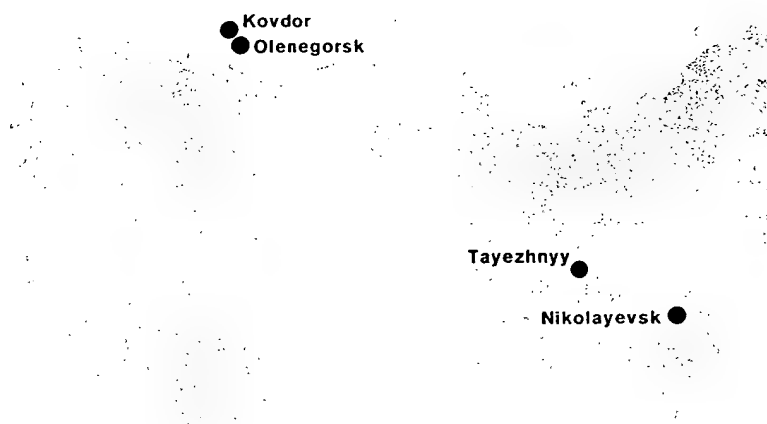
Market Conditions

The world market for gem diamonds is centered in the United States and Western Europe, which taken together probably account for more than three-fourths of all diamond sales. In 1970, sales of diamonds by the deBeers organization dropped by 23% from the 1969 level, reflecting the generally poor economic conditions in the United States and Western Europe. Given the observed secular trends of the past, the long-term growth in demand for diamonds undoubtedly will resume with an upturn in economic activity in the industrial West.

Soviet Interest in Foreign Assistance

Joint Soviet-US exploitation of diamond deposits was proposed by Premier Kosygin with payment for US equipment and services in diamonds. The USSR is not known to have approached any other non-Communist country for technical assistance in the development of its diamond deposits.

Iron Ore



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Resources

The USSR has the largest iron ore reserves in the world. According to a recent UN survey of world iron ore resources, Soviet reserves of exploitable iron ore exceed 100 billion tons and account for more than 40% of the world total. For the most part, Soviet iron ore is of no more than average quality and generally requires upgrading. While the major producing area currently is in the Krivoy Rog Basin in the Ukraine, the Kursk Magnetic Anomaly, located between Orel and Khar'kov, is said to contain the world's largest reserves of rich ore. Output is still relatively small compared with that at Krivoy Rog, but eventually it is scheduled to rival or surpass the latter. Other important producing deposits include: the Sokolov-Sarbay deposits in Northern Kazakhstan, the Gorniya Shoriya area south of Novo Kuznetsk; the Olenegorsk and Kovdor deposits in the northwest; the Magnitogorsk and Kachkanar deposits in the Urals; and the Abadan, Kerch', and Dashkesan deposits.

Production

The USSR is the largest producer of iron ore in the world, not only providing completely for its own needs but, in addition, furnishing more than half of the requirements of the Communist countries of Eastern Europe. In 1970, the USSR produced 196 million tons of usable ore. The United States, in contrast produced less than half that amount and imported about 46 million tons.

In recent years the USSR has increased expenditure on beneficiation facilities to upgrade the quality of iron ore, which, on the average, has been declining. Also in its campaign to improve its blast furnace technology, the USSR has emphasized construction of sintering and pelletizing facilities, to provide a better charge for the blast furnaces.

Exports

The USSR has steadily increased its exports of iron ore in the past decade from about 15 million tons in 1960 to 36 million tons in 1970. Most of the exports go to the Communist countries of Eastern Europe. Shipments to these countries in 1970 amounted to about 32 million tons, and the remainder of about 4 million tons went to Japan, the United Kingdom, Italy, and Austria.

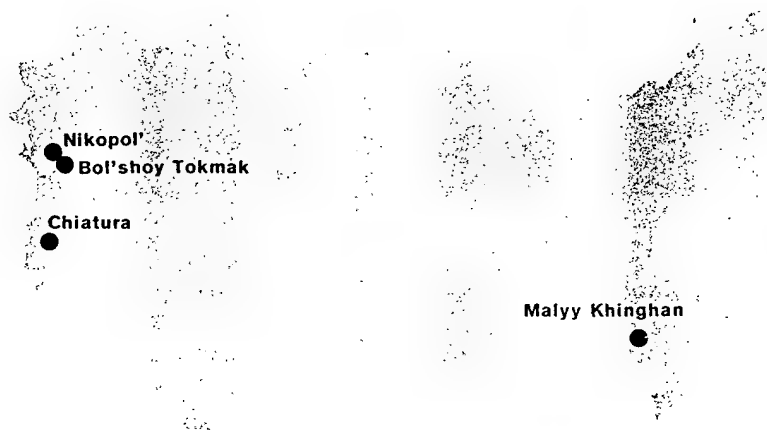
Market Conditions

Demand for iron ore currently is less than brisk, reflecting the sluggish tempo of the world steel industry and economic activity in general. As a result, supplies on world markets continue to be plentiful. Over the longer term, however, demand for iron ore should resume a steady growth as the world's need for iron and steel products continues to grow. According to estimates of the US Bureau of Mines, world demand for iron will grow at a compounded rate of roughly 1-1/2% to 2-1/2% for the foreseeable future.

Soviet Interest in Foreign Assistance

The USSR has been negotiating with the United Kingdom for help in expanding iron ore production on the Kola Peninsula and with Japan to develop iron ore resources in the Soviet Far East. In addition, the Soviets have purchased a pelletizing plant from the United Kingdom and have negotiated with several other countries, including the United States, for additional pelletizing facilities. The USSR has not sought US assistance for the development of its iron ore resources.

Manganese



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Resources

Among the major steel-producing countries of the world, only the USSR is fully self-sufficient in manganese. The extremely large reserves of the USSR, estimated to exceed 2 billion tons of ore, are second only to those of South Africa. Soviet reserves are located principally in the Nikopol' district of the Ukraine and in the Chiatūra district of Georgian SSR. Another important deposit is found near Bol'shoy Tokmak in the Ukraine with additional, but smaller, deposits located in Kazakhstan, the central Urals, East Siberia, and the Far East. The quality of Soviet manganese ore deposits, with roughly 25% manganese content, is somewhat lower than that of the major producing countries in the non-Communist world. The USSR currently has to beneficiate all manganese ore.

Production

The USSR is the world's largest producer of manganese ore, accounting for about 40% of world output. In 1970, Soviet production of manganese ore amounted to 6.1 million tons, nearly three times the next larger producer, South Africa. Production has declined in recent years, however, and in 1970 was about 1.6 million tons less than in 1966, the peak year for Soviet production of manganese ore. Nevertheless recent levels of production are currently adequate to satisfy domestic requirements and support a substantial export trade.

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The two principal Soviet manganese mining sites are located at Nikopol' and Chiatura. Production costs in these areas are relatively high compared with most major manganese mines in non-Communist countries. In the open-pit operations at Nikopol', the Soviets must contend with an unusually high ratio of waste material to ore. In addition, the underground mining operations at both Nikopol' and Chiatura involve difficult problems of access and construction.

Exports

During the last half of the 1960s, the USSR exported about 1.2 million tons of manganese ore each year. The Communist countries took about two-thirds of total shipments, with most of the remaining third going to the United Kingdom, France, and Japan. The United States, which is dependent on imports for virtually all of its requirements, currently does not import manganese ore from the USSR. The high tariff rate to non-MFN countries of about 35% would discourage large-scale exports to the United States. The MFN rate is about 5%.

Market Conditions

World demand for manganese ore probably will continue to grow steadily in the foreseeable future, largely to support further expansion of the world steel industry. Because US steel output is expected to grow at a rate below the world average, however, demand for manganese ore in the United States will grow more slowly than in the rest of the world.

Reported programs for expansion of production capacity indicate that at prevailing prices the world supply of manganese ore is likely to keep pace with the growth in demand in the near future. South Africa, Gabon, Brazil, and India probably will continue to be the main suppliers to non-Communist countries, although Australia may gain in importance as a supplier as its mineral resources are developed further.

Soviet Interest in Foreign Assistance

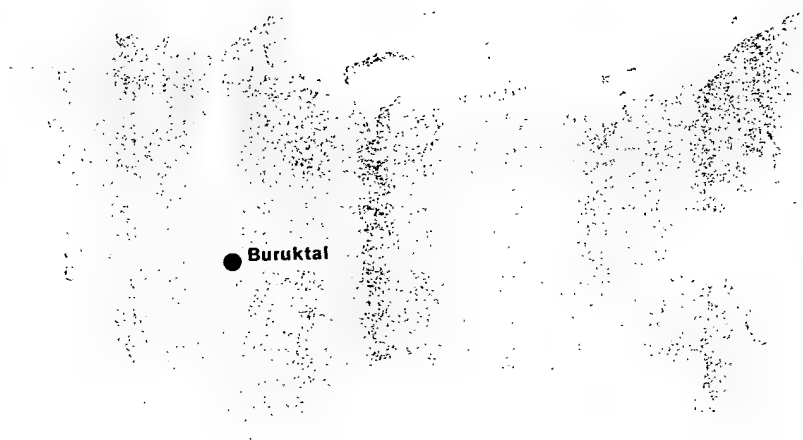
Premier Kosygin has expressed an interest in having the United States participate in a joint program for the development of the Soviet manganese industry, with US assistance paid for by Soviet exports of manganese ore to the United States. So far, it has not been made clear whether the USSR is seeking aid to expand operations at deposits presently under exploitation or to develop other deposits in the Ukraine or possibly the Far East.

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Table 2
Production and Imports of Industrial Raw Materials
by Major Country of Origin, 1970

	Copper Ore ^{a/} (Thousand Metric Tons)	Coating Coal (Million Metric Tons)	Copper ^{b/} (Thousand Metric Tons)	Crude Oil (Million Metric Tons)	Diamonds (US \$)	Iron Ore (Million Metric Tons)	Manganese (Thousand Metric Tons)	Rubber (Billion Cubic Meters)	Nickel (Thousand Metric Tons)	Molybdenum (Million Metric Tons)	Platinum- Group Metals (Thousand Prol Ounces)	Lumber (Billion Board Feet)	Wool NIP (Million Metric Tons)	Manufactured Fibers (Billion Square Feet, excluding specialty)	Paper and Paperboard (Million Metric Tons)	Titanium (Thousand Metric Tons)
5 production	0	133.0	1,601.3	473.1	0	90.3	4.0	60.1	13.9	35.1	370.3	36.7	37.9	1.9	47.6	19.0
5 imports	617.7	0	30.3	165.8	432.8	45.6	768.1	76.1	106.5	Metl.	1,756.3	6.1	3.2	4.2	6.6	6.0
or which:																
Belgium	..	..	..	..	110.7	..	..	..	..	..	..	..	..	..	..	..
Canada	..	..	..	..	..	2.0	..	..	..	..	..	..	..	..	..	..
China	..	..	..	..	..	4.6	..	..	..	..	..	..	..	..	..	..
Cuba	..	..	..	..	..	1.6	..	..	..	..	..	..	..	..	..	..
Gabon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
India	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Israel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Japan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Libya	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mexico	..	..	..	..	..	1.9	..	..	..	..	..	..	..	..	..	..
Netherlands Antilles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Philippines	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Poland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Korea	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Taiwan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thailand	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Turkey	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
USSR	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
United Kingdom	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
United States	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virgin Islands	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
at supply ^{b/}	637.7	133.0	1,601.6	640.9	432.8	137.9	770.1	64.2	120.4	35.1	1,756.8	42.8	41.1	6.1	54.2	21.0
or as percent	100	0	16.8	23.9	100	33.1	99.5	4.1	88.5	0	78.5	14.1	7.8	50.9	12.2	28.6
Million metric tons of primary refined copper, imports of blister (crude) and refined copper, including secondary metal. Production plus imports.																

Nickel



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Resources

The USSR claims to have the world's largest reserves of nickel ores, although information to support this claim is not available. Independent estimates by the US Bureau of Mines put Soviet reserves equal to those of Canada but less than those of Cuba and New Caledonia. About 80% of Soviet deposits are located in the copper-nickel sulfide deposits at Pechenga, Monchegorsk, Noril'sk, and Talnakh in the Soviet North. The remaining deposits consist of lateric deposits in the Urals and Kazakhstan and nickel-cobalt arsenides in Tannu-Tuva. Soviet ores are generally low grade; the nickel content of the sulfides averages about 0.3% to 0.6% and of the laterites about 1.5%.

Production

The USSR is second only to Canada in the production of nickel and nickel products. Production in 1970 is estimated at 140,000 tons, nearly 70% of Canadian output but about ten times US production. The Noril'sk deposit accounts for about half of Soviet nickel production and the Monchegorsk and Pechenga deposits another third. Although no goals have been given for the new Five-Year Plan, undoubtedly another substantial boost in nickel output will be included. If production continues to increase at the same average annual rate achieved during 1966-70, Soviet output in 1975 will reach about 200,000 tons.

Exports

The USSR exports considerable nickel to Western Europe and Japan and a small quantity to the United States. During 1966-70, total exports to the industrial West ranged from 14,000 to 19,000 tons, with annual hard currency earnings averaging up to \$100 million. The USSR also exports nickel to other Communist countries, but the amount is not known.

Market Conditions

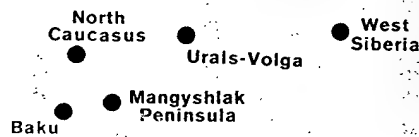
For more than a year the nickel market has been very weak, reflecting a lagging level of world demand. Although a significant growth in demand is expected by 1975 and beyond, (as the economies of the industrialized countries emerge from the current economic slowdown), new supplies of nickel probably will keep ahead of demand even at current prices. The International Nickel Company plans a substantial increase in its Canadian production alone by 1975, apart from major expansions of output in New Caledonia and Guatemala. Moreover, the other major nickel producers, Falconbridge of Canada and Le Nickel of France, are adding new productive capacity. Finally, discoveries in Australia give promise of important contributions to potential world supply.

Soviet Interest in Foreign Assistance

The USSR has negotiated with the United Kingdom, France, and Japan - so far unsuccessfully - for an estimated \$70 million to \$100 million investment for development of the Buruktal nickel deposits near Orsk in the Southern Urals. Payment would be in nickel. During Secretary Stans' recent visit to Moscow, Foreign Trade Minister Patolichev strongly recommended the Buruktal deposits as a promising project for US investment.

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Petroleum



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CRUDE OIL

Resources

The USSR possesses abundant potential resources of petroleum. However, more than one-third of these reserves are located in permafrost regions where extraction is both difficult and costly. As of the end of 1970, "explored" reserves⁽¹⁾ of crude oil in the USSR were estimated to be between 4 billion and 5 billion tons, an 11-14 year supply at the 1970 rate of production, or about 5% to 6% of estimated total "proved" reserves of oil in the world. By comparison, the United States, as of the end of 1970, had proved reserves of 5.3 billion tons of oil, an 11-year supply and about 6% of the world reserves.⁽²⁾

1. The Soviet concept of "explored" reserves is broader than the US concept of "proved" reserves. Under the US definition, proved reserves are established on the basis of drilling and include only the crude oil and natural gas liquids recoverable from known deposits under existing economic and operating conditions. Soviet "explored" reserves are inferred or estimated on the basis of less extensive drilling, and capability for economic extraction is not a requirement for inclusion. Hence, in terms of the US definition, Soviet reserves would constitute a smaller share of the world total.

2. More than half of the world's proved oil reserves are located in the Persian Gulf region of the Middle East and about 12% in North Africa.

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Most Soviet proved reserves of oil are concentrated in the Urals-Volga region. However, these reserves have been exploited since World War II and are being depleted rapidly. About three-fourths of the potential resources of petroleum (that is, proved and unproved reserves), according to Soviet claims, are located in Siberia and Central Asia. In addition, the continental shelf areas of the USSR may contain large unproved reserves of oil and gas. The most promising areas are located in the Caspian Sea (where drilling has been conducted for 20 years), the Black Sea, in the Far East off Sakhalin, and in the Northern Arctic waters beyond the Ob' River delta.

The quality of Soviet crude oils varies somewhat from region to region. The oil of the older fields near Baku on the Caspian Sea has a paraffin base and contains few corrosive elements such as sulfur and salt. That of the Urals-Volga region has an asphalt base and is higher in sulfur and salt content. The oil of the newer fields on the Mangyshlak Peninsula and in West Siberia is more like that of Baku, except that the Mangyshlak oil has a very high wax content and pour point and tends to solidify at temperatures below 90° Fahrenheit.

Production

The USSR is second only to the United States in the production of crude oil. In 1970 the USSR produced about 350 million tons of crude oil, roughly one-sixth of the world total; by comparison the United States produced about 475 million tons of crude oil, or about one-fifth of the total world output. During the past decade, the average annual rate of increase in the output of crude oil in the USSR has been very rapid, about three times faster than in the United States. Soviet plans call for crude oil production to reach 496 million tons by the end of 1975.

Most of the increase in production in the 1960s resulted from the intensive development of a number of very large oilfields in the Urals-Volga region. The region as a whole currently accounts for about 60% of the domestic output of crude oil. Reserves, however, have been prematurely depleted⁽³⁾ and by the late 1970s, West Siberia will supersede the Urals-Volga area as the principal oil producing region in the USSR. The role of two areas of Central Asia -- Kazakh SSR and Turkmen SSR -- also will increase. By 1980, production of crude oil in West Siberia is planned to reach 230 million - 260 million tons, and in Central Asia, 75 million -- 85 million tons. By contrast, output in the Urals-Volga region could fall below the current level of about 200 million tons.

3. To meet plan goals, production was forced by improper water-flooding of oilfields during initial stages of exploitation to maintain pressure. This procedure resulted in unexpected water encroachment of the fields causing a reduction in oil recovery and loss of a significant part of the reserves in place.

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Crude oil production in the USSR is characterized by rising average costs. Higher costs are generated by the greater technological requirements for developing new deposits and by the increased requirements for pumping and water separation in older fields. The lowest production costs are in the Urals-Volga region where relatively shallow deposits are situated in strata well-suited for exploitation using current Soviet equipment and technology. In West Siberia, where extremes of climate, difficult terrain, and distance impose special requirements for equipment, costs are much higher. According to published Soviet data, the average cost of producing oil in West Siberia in 1967 was about five times that in the Urals-Volga region. Since 1967, however, as development has progressed in Siberia, costs have declined somewhat.

Exports

In recent years, Soviet exports of oil have been the largest single source of foreign exchange earnings. In 1970, total exports of crude oil and oil products amounted to about 96 million tons.⁽⁴⁾ About 40% went to the industrial West and earned some \$390 million in hard currency. The United States, which imports small quantities of fuel oil from the USSR for industrial use on the Eastern seaboard, purchased about 170,000 tons in 1970.⁽⁵⁾

However, Communist countries of Eastern Europe receive the largest share of Soviet oil exports. The area as a whole (excluding Romania, which is a net exporter of oil) has become increasingly dependent on the USSR, which now provides about 85% of its total oil supply.

Soviet exports of crude oil to Eastern Europe during 1971-75 are scheduled to total 243 million tons, about 75% more than the volume of exports of the previous five-year period. Shipments of that magnitude would have a value of some \$4 billion⁽⁶⁾ and would constitute about 11% of Soviet crude oil production during the current Five-Year Plan period.

Although the expected level of exports to the West during 1972-75 is not known, probably some modest growth in the volume of exports will take place. For the longer term, the amount of petroleum that will become available for export to the West may well depend on the extent to which foreign technology and equipment are acquired to expand oil production in West Siberia. If the USSR relies solely on its own industrial resources,

4. 67 million tons of crude oil and 29 million tons of products.

5. A tariff rate of \$.21 per barrel or about 5% applies to non-MFN countries, such as the USSR, compared with a rate of \$0.0525 per barrel or slightly more than 1% to MFN countries.

6. At 15 rubles per ton (f.o.b.), the average price in recent years.

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the annual rate of increase in oil production after 1975 probably will decline, and oil available for export to all customers might not exceed the present level of about 100 million tons.

Market Conditions

In 1970, demand for oil in the non-Communist world amounted to about 2 billion tons; by 1980 it may reach 3.7 billion tons. Demand is growing fastest in Western Europe and Japan, which, together, account for about 70% of all the oil consumed in the non-Communist world, excluding the United States. Most of the petroleum needs of Japan and Western Europe will have to come from the Middle East and Africa. Production in those regions probably will keep pace with the growth in demand.

By 1980, US demand for oil may reach about 1.1 billion tons. However, the National Petroleum Council has estimated that domestic US output may not exceed 600 million tons, and, accordingly, foreign sources may be needed to supply up to nearly half of the US market demand.

The growing dependence of the United States, Western Europe, and Japan on foreign sources for petroleum presents the USSR with a strong opportunity to expand its hard currency earnings through increases in exports to those markets. However, without a substantial input of foreign technology and equipment to help develop the extensive petroleum resources in Siberia, the USSR may be unable to maintain its present level of oil exports to the non-Communist world.

Soviet Interest in Foreign Assistance

Within the past 18 months the USSR has stepped up its efforts to procure a variety of geophysical exploration and oilfield production equipment from the United States. The USSR has either purchased or requested bids on equipment and technology valued at about \$100 million. US manufacturers of petroleum equipment recently estimated that the Soviet Union might be a market for very large amounts of exploration, drilling, production, and pipeline equipment -- perhaps as much as \$500 million per year -- if unilateral US trade controls are relaxed.

The USSR also has expressed interest in US participation in Soviet offshore oil and gas drilling and production operations. Soviet experience in offshore deep water drilling is quite limited. For example, the USSR has only three mobile drilling platforms, all located in the Caspian Sea. Most of the offshore drilling operations in the Caspian have been accomplished by means of fixed trestles that extend from the shore for several miles into shallow waters. Current plans call for the construction of ten more mobile drilling platforms during the 1970s.

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NATURAL GAS

Resources

By the end of 1970, "explored" reserves of natural gas in the USSR were reported by the Soviets to be about 12 trillion cubic meters (cu.m.), a 60-year supply at present rates of production. However, because Soviet estimates of "explored" reserves are based on insufficient drilling and are grossly inflated,⁽⁷⁾ Soviet reserves of natural gas that have been proved by drilling and are available for production are estimated to amount to only some 3 trillion cu.m., about a 15-year supply. This reserve compares with proved reserves of 8.2 trillion cu.m. in the United States -- about a 13-year supply -- and 45 trillion cu.m. for the world as a whole.

At least half of the "explored" gas reserves in the USSR are located in permafrost regions of West Siberia (in the Ob' River delta), and about one-fourth of the total are found in the deserts of Central Asia. Most of the remainder lie in the Ukraine, North Caucasus, and Urals-Volga region in the European part of the country.

Most Soviet gas is rich in methane and has a high calorific content. However, the gas of Central Asia reportedly has some highly corrosive properties, and that of Western Siberia in most cases is accompanied by sand and water, which will complicate production operations.

During the past five years, the Soviet Union claims to have discovered 15 giant gas fields; 10 of these -- located in the Ob' River delta of West Siberia -- are expected to be major producers. However, none of the latter have been developed yet because of the overlying permafrost, which complicates drilling, production, and pipeline operations.⁽⁸⁾

Other factors affecting the development of these deposits are poorly consolidated sand reservoirs in the Siberian structures, the presence of

7. For example, negotiations for sale of Soviet gas from Sakhalin to Japan were suspended in 1970 when Premier Alexei Kosygin revealed that reserves of gas in Sakhalin were actually only 16 billion cu. m. and not 60 billion cu. m. as claimed in official Soviet statistics. Thus the reserves of gas were not adequate to supply Japan with 2.4 billion cu.m. annually for 20 years as had been discussed in the negotiations.

8. The difficulty of extracting natural gas in permafrost areas is well illustrated by the case of the Tazov gasfield, one of the major fields in West Siberia. Failure to insulate the well casing in permafrost resulted in the warm gas melting the permafrost, causing the casing to collapse and extensive cratering of the area. As a result a huge amount of gas was lost, and the USSR no longer lists this field as one of the country's most important gas deposits.

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natural gas liquids that must be disposed of, and the formation of gas hydrates that freeze at the well head and stop the flow of gas. In addition, Soviet engineers are faced with the formidable problem of building long-distance, large-diameter pipelines over permafrost and difficult terrain to move the gas to major consuming areas in the European part of the USSR.

Production

The United States leads the world in the production of natural gas; the USSR is a distant second. In 1970 the United States produced nearly 620 billion cu.m., about 54% of the world's total output. The Soviet Union, on the other hand, produced slightly less than 200 billion cu.m., about one-sixth of the world total. The gap between Soviet and US gas production, however, is closing. During the past five years (1966-70) the Soviet average annual rate of increase in natural gas production - 9.2% - was about 50% greater than that in the United States.

In 1975 the USSR plans to produce 320 billion cu.m. of natural gas, an ambitious goal in light of the gas industry's chronic failure to fulfill plans throughout the past decade. Attaining the target for 1975 will require an average annual increment in output of 24 billion cu.m., or about 70% more than the average of 14 billion cu.m. per year attained during the previous five years.

About half of the Soviet production of natural gas in 1970 came from four large deposits: Shebelinka in the Ukraine, Krasnodar and Stavropol' in the North Caucasus, and Gazli in Central Asia. However, all of these gas fields have reached their peak levels of production, and gas production from them will decline in the future.

Preliminary plans for 1980 call for natural gas output from West Siberia to reach 230 billion to 260 billion cu.m., and from Central Asia, about 110 billion to 125 billion cu.m. These levels of output, coupled with a stabilized production of 125 billion cu.m. in the European part of the country, would boost total output to 500 billion cu.m. by the end of the decade. Even assuming that proved reserves are adequate, however, the attainment of this output will require overcoming production and transportation difficulties noted above. As a greater share of national output is obtained from West Siberia, the average cost of producing natural gas, which currently is relatively low, should rise. Moreover, the delivered price to customers in the European part of the USSR will be pushed up even higher because of the additional cost of piping Siberian gas over longer distances.

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Exports

Although the USSR is currently a net importer of natural gas, it does export small quantities. In 1970, exports of somewhat more than 3 billion cu.m. (70% to Eastern Europe) were more than offset by imports of nearly 5 billion cu.m. from Afghanistan and Iran. Nevertheless, by 1975 the USSR should be a substantial net exporter of natural gas. Total exports of Soviet gas in that year may amount to 22 billion to 26 billion cu.m. and by 1980 may reach 35 billion to 45 billion cu.m. Hence, even though the USSR plans to increase its imports of natural gas from Afghanistan and Iran,⁹ it should be a net exporter of 8 billion to 12 billion cu.m. by 1975 and of some 20 billion cu.m. by 1980.

Soviet exports of natural gas in the 1970s probably will be divided about equally between Communist and non-Communist countries. Throughout the decade, exports to Communist countries are expected to increase sharply, reaching 13 billion cu.m. by 1980. In addition, a substantial increase in exports to non-Communist countries is indicated by the Soviet success in the past two or three years, including agreements with Austria, West Germany, Italy, Finland, and France to supply natural gas for 20 years in exchange for large-diameter pipe and ancillary oil and gas pipeline equipment. Austria now is receiving almost 1 billion cu.m. per year, and, during 1973-75, Italy, West Germany, and France should begin to receive Soviet gas via a 48-inch (possibly 56-inch) diameter pipeline now under construction through Czechoslovakia. Moreover, negotiations for sales of Soviet gas to Japan have been under discussion for some time, and an agreement may be reached in the near future.

Market Conditions

The demand for natural gas in the non-Communist world during 1971-80 is expected to rise at an average annual rate of about 5%. In the United States, natural gas now provides about 30% of the total energy supply, although this share may decline somewhat by 1980. According to a recent study by the National Petroleum Council, under current government regulatory policies, US production of natural gas may fall far behind domestic demand in the 1970s, and by 1980 the shortfall in supply could be as much as 330 billion cu.m., or about one-third of total demand. Another, more conservative estimate, by the Director of Conch Methane Services Ltd., places the probable deficit in US domestic supply in 1980 at 70 billion cu.m. In any case, it appears probable that imports of natural

9. Imports from these countries are scheduled to rise to 14 billion cu. m. by 1975 and, in subsequent years, could reach 24 billion cu. m. per year if a second pipeline from Iran, which has been under discussion, can be justified economically.

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gas, which in 1970 totaled about 26 billion cu.m. or about 4% of the total US gas supply, will increase significantly during the latter half of the decade.

Soviet Interest in Foreign Assistance

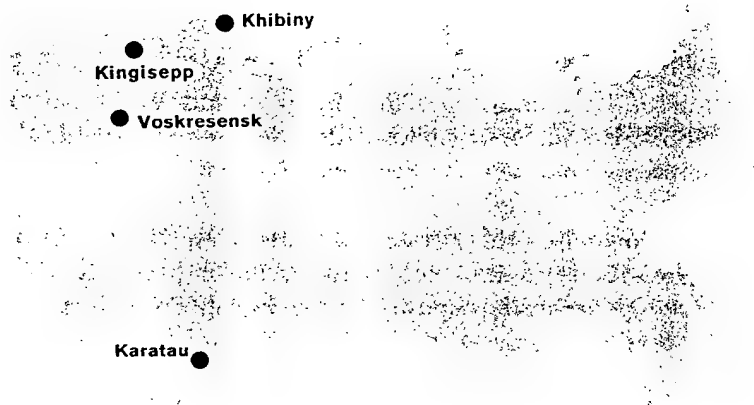
The USSR has shown an interest in having the United States assist in the construction of facilities for its natural gas industry in exchange for delivery to the United States of liquefied natural gas (LNG). Late in 1969, A.K. Kortunov, Minister of the Gas Industry in the USSR, proposed to a representative of a US firm that a US consortium be established to buy Soviet LNG and to arrange for delivery to the USSR of predetermined "turnkey" plants. Recently, representatives of Tenneco and Texas Eastern Corporation discussed with Soviet officials, the possibility of importing Soviet LNG for the northeastern United States. It was contemplated that such imports would begin at a minimum of 2 billion cubic feet per day in 1976 or later, and that they might rise to 4 billion cubic feet per day by 1980. The capital requirements for such an arrangement would be high, perhaps in the neighborhood of \$4 billion.

The USSR also has demonstrated a keen interest in Japanese participation under a similar arrangement in the development of Soviet gas resources in Eastern Siberia and, although no firm agreement has been made, negotiations have been under way for more than two years. The Soviet proposal, which will require a Japanese investment of at least \$1 billion, includes a natural gas pipeline to be built from Eastern Siberia to a Soviet Far East port, the construction of a liquefaction plant at the port, and shipment of liquefied natural gas to Japan by tanker. In view of Japan's rapidly growing energy demands and its lack of domestic sources of supply, an offer of an assured long-term supply of natural gas may be inviting.

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Phosphates



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Resources

Reserves of phosphate rock⁽¹⁾ in the USSR are the third largest in the world, ranking only behind those of the United States and Morocco. The phosphorus content of Soviet reserves is estimated by the US Bureau of Mines at about 2.4 billion metric tons. More than one-third of these reserves consist of apatites that can be processed into high-grade concentrates containing 39.4% P_2O_5 , which, in turn, are suitable for conversion to superphosphate or complex fertilizers and to other phosphate products. The USSR also has resources of phosphorus in the form of sedimentary phosphorites that are difficult and costly to process. Thus far, they have yielded primarily low-analysis ground phosphate (phosphorite meal) used for direct application as fertilizer.

More than 80% of the apatite reserves are located at the Khibiny apatite-nepheline deposits in the central part of the Kola Peninsula. Kola apatites are the source of three-fourths of the phosphate fertilizers produced in the USSR (excluding ground phosphate used for direct application). Exploitation of these Kola deposits has been expensive because of the long hauls required to transport the apatite to the Ukraine and other major fertilizer-consuming regions.

1. Phosphate rock is a natural rock used in the manufacture of phosphate fertilizers, phosphoric acid, phosphorus, and animal feeds. The chemical composition is expressed in terms of the content of phosphorus (P), phosphorus pentoxide (P_2O_5), or bone phosphate of lime.

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Other deposits of apatite are located at Beloziminsk and Ulan-Ude in Eastern Siberia. A processing complex is currently under construction to work the Beloziminsk deposits. In addition, apatites are said to be recoverable from iron ore now being extracted from deposits on the Kola Peninsula.

The principal sedimentary phosphorite deposits are located in the Karatau region of Kazakhstan and at Kingisepp and Voskresenski in the European RSFSR; less important phosphorite deposits are found in Estonia, Western Kazakhstan, and Central European RSFSR.

Difficulties in mining the Karatau deposits, coupled with problems in removing admixtures from the ores, tend to make production relatively costly. Similarly, phosphorite deposits in the European regions now being exploited are costly to process.

Finally, very large deposits of phosphate are said to exist in the Hobsogol' area of the Soviet Union's nearby client state of Mongolia. These deposits have been jointly prospected by Soviet and Mongolian geologists and are said to contain phosphate rock reserves totaling one billion tons.⁽²⁾ Mongolia has proposed that the USSR and other members of the Council for Mutual Economic Assistance (CEMA) erect facilities to produce phosphorus from these deposits.

Production

In 1970 the USSR produced an estimated 18 million tons of phosphate rock, more than half of the amount produced in the United States, and more than one-fifth of the estimated world output of 80 million tons. The Kola apatite deposit accounted for more than 60% of total Soviet output in 1970. The remaining output comes from sedimentary phosphorites, with the Karatau and Kingisepp facilities being the principal producers. At all three locations, output has fallen below Soviet expectations. In the case of Karatau, production has lagged because efforts to beneficiate the ore by normal flotation processes have not been very successful. With the aid of Western equipment, some of the low-grade Karatau ore now is being processed into phosphorus using electrothermal processing techniques.⁽³⁾ In the case of Kingisepp,⁽⁴⁾ difficulties in the processing phase also have

2. Believed to be expressed in terms of phosphate rock rather than in terms of phosphorus.

3. The electric furnaces used in this process were supplied by a West German firm, which has accepted partial payment in Kola apatite concentrates.

4. Partially developed as a joint investment project of the USSR and several members of CEMA.

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hampered the production of high-quality concentrate and forced the use of much of the phosphate in direct fertilizer applications.

Exports

Total exports of phosphate rock (ores, concentrates, and meal) in 1970 came to more than 5.5 million tons, accounting for about 15% of world exports of phosphate rock. Shipments abroad consist primarily of apatite concentrate from the Kola deposits along with small quantities of apatite ores and ground phosphate rock (phosphorite meal).

Two-thirds of the Soviet exports of apatite concentrate go to Eastern Europe, with most of the remainder going to West Germany, Finland, Belgium, the United Kingdom, and Scandinavia. In its quest for hard currency, the USSR probably will continue to export substantial quantities of phosphate rock to the industrial West. However, any growth in such exports during 1971-75 probably will fall short of the more than 100% increase achieved during 1966-70. The Soviets will need increasing quantities of phosphates to support internal goals for the production of fertilizers. Output of phosphate fertilizers in the USSR is scheduled to rise by 87% during 1971-75, compared with a rise of 57% during 1966-70.

Market Conditions

The world phosphate market is characterized by excess capacity, intense competition, and relatively low prices. During the 1960s, the production of phosphate rock outran demand and led to a buildup of large stocks of both phosphate rock and phosphate fertilizers. World output virtually has stagnated since 1967. US output of phosphate rock was about 34 million tons in 1969 and 35 million tons in 1970, somewhat below the 37.4 million tons produced in 1968. Export prices for US phosphate rock have fallen considerably in the last five years.

Moreover, in the near future, world production of phosphate rock may continue to outpace world consumption. By 1975, world consumption of P_2O_5 will reach an estimated level of 32 million tons, and, if present plans are carried out, production could reach 38 million tons.⁽⁵⁾ In the USSR the output of apatite concentrate alone probably will grow by about 3 million to 4 million tons during 1971-75, and the production of sedimentary phosphorite probably will increase also. Members of CEMA are being urged to assist the USSR in construction of facilities to produce phosphorus in

5. If as seems likely, prices in the industrial West continue at a relatively low level, or even decline further, the indicated plans for non-Communist producers may be revised downward.

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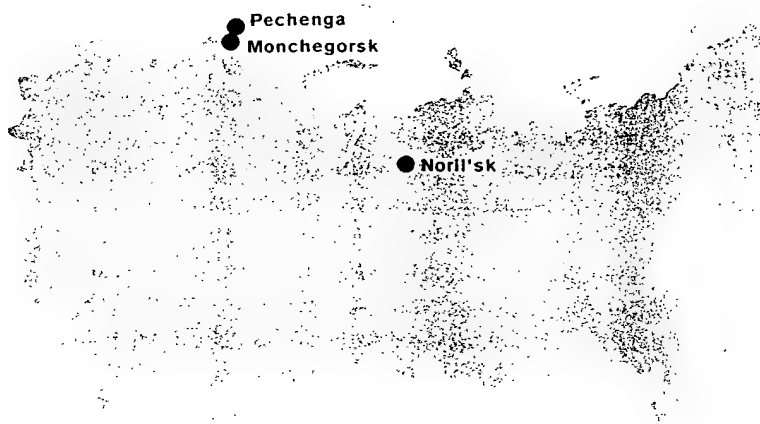
the area of Karatau. The ample reserves of phosphate rock in the world suggest that supply will be adequate to meet demand even beyond 1975 without a marked increase in prices.

Soviet Interest in Foreign Assistance

Premier Kosygin has expressed interest in a Soviet-US joint venture to develop Soviet phosphate deposits. Although no other non-Communist country is known to have discussed participation in development of Soviet phosphate deposits, West Germany and Japan, both large importers of phosphates, may be interested. As indicated above, West Germany already has accepted some phosphate rock from the USSR as a partial payment for phosphorus furnaces.

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Platinum-Group Metals



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Resources

Soviet reserves of platinum-group metals, estimated by the US Bureau of Mines to be roughly 200 million troy ounces, are the largest in the world. The USSR has about 25% of the world's known reserves of platinum, 65% of the palladium, and about 50% of the rhodium. Soviet platinum-group metals are recovered principally as byproducts from the Noril'sk Copper-Nickel Combine. Extension of the present ore deposits in the Noril'sk region and the discovery of new deposits nearby at Talnakh have insured continued high output for many years. Platinum-group metals are also recovered from the copper-nickel facilities at Pechenga and Monchegorsk in the Kola Peninsula and placer facilities in the Urals near Nizhniy Tagil and Sysert. The yield of platinum-group metals from existing deposits is good. Reportedly the undeveloped deposits at Talnakh are also rich in platinum-group metals.

Production

The USSR, with an estimated annual production of 2.1 million troy ounces, is the world's largest producer of platinum-group metals. Soviet production accounts for nearly two-thirds of world output and is more than twice that of South Africa, the world's second largest producer. About 70% of Soviet production consists of palladium, about 25% is platinum, and the remaining 5% consists of other metals of the group. Because it

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makes up a relatively small share of the total, however, Soviet production of platinum is only about three-fourths as great as that of South Africa.

Exports

The USSR has been a major supplier of platinum-group metals to the non-Communist world for many years. Only small amounts of these metals are exported to other Communist countries. Soviet exports of platinum-group metals to non-Communist countries increased from about \$73 million in 1965 to about \$100 million in 1970. About 70% to 80% of these exports consisted of palladium, reflecting the high proportion of palladium in Soviet production of platinum-group metals. In 1970 the United States imported about 494,000 ounces of platinum-group metals, valued at about \$23 million from the USSR. The Soviet shipments accounted for about 5% of the US supply of platinum, about 15% of the rhodium, and about 46% of the palladium.

Market Conditions

World demand for platinum-group metals probably will increase steadily in the years ahead to meet varied and growing uses in catalytic agents for the petroleum industry, industrial chemicals, electrical devices, and dental, medical, and jewelry applications. The US Bureau of Mines, in its long-range projection to the year 2000, estimates that demand in the United States will grow steadily but at a somewhat lower rate than in the rest of the world. The estimated growth of demand in the United States is 1.5% to 3.5% per year compared with 3% to 4.5% in the rest of the world.

Soviet Interest in Foreign Assistance

The USSR has shown no interest in obtaining foreign assistance to expand the production of platinum-group metals. Soviet interest is unlikely because most of the platinum-group metals are obtained as by-product from the mining of copper and nickel ores in Noril'sk. With few exceptions, this area is closed to foreigners.

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TIMBER

Resources

The USSR has the most extensive forest resources of any country in the world, although the usable resources are probably less than implied in official data. According to official data, forests cover about 747 million hectares, or about one-fifth of the forest covered area of the world and a little more than the combined forest area of the United States and Canada. Conifers occupy about three-fourths of the total forest area within the USSR. The maximum quantity of timber that could be felled annually from all forests is reported officially to be 874 million cubic meters (cu. m.). A more realistic figure, taking into account forest areas where access is extremely difficult, is about 650 million cu.m. The corresponding figure for the United States is about 500 million cu. m.

East Siberia and the Far East are the regions of greatest potential development containing about two-thirds of the volume of growing stock of timber. Largely unexploited, these forests currently account for only about one-fourth of the annual wood supply. The Yenisey-Angara River basin and Khabarovsk Krai are areas of particular potential.

The USSR leads the world in total annual wood removal by volume, with the United States in second place. About 380 million cu. m. of wood were removed from Soviet forests in 1970, compared with about 340 million cu. m. in the United States. About 80% of the Soviet wood is used for industrial purposes, compared with about 94% in the United States, and the remainder is used for fuel.

Production

The USSR exceeds the United States in the production of lumber -- about 48 billion board feet in 1970 compared with about 37 billion in the United States. In the production of the more valuable (per unit of wood) wood-based products, however, the United States enjoys an enormous advantage. For example, the United States produces annually about seven times as much wood pulp, plywood, and paper and paperboard. US output of particle board is almost twice that of the USSR, and fiberboard about four times. The relatively inferior performance of the USSR in the output of those items is accounted for, very largely, by shortages of wood-processing facilities and by the failure to convert more of the wood waste into useful wood-based products.

In the current Five-Year Plan period, the USSR is emphasizing the construction of wood-processing facilities rather than timber felling. Also,

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a major campaign is under way to reduce the waste of wood raw materials. Output of wood-based panels and pulp is scheduled to increase significantly.

Market Conditions

The world demand for timber products is expected to rise steadily despite a growing use of wood-substitute materials in construction. Moreover, world production of timber products is expected to keep pace with the increased demand. Packaged lumber is becoming increasingly preferred by major non-Communist countries because of increasing costs associated with the handling of loose lumber in docks and yards. The USSR could suffer a disadvantage in international markets if a shift to the production of packaged lumber is not accelerated. The demand for processed wood products such as plywood, other wood-based panels, paper, and paperboard is also on the increase throughout the world, particularly in the United States.

There does not appear to be any significant potential for direct Soviet sales of lumber and other wood products in the United States for the foreseeable future. Canada supplies most of the US import needs for softwood lumber, newsprint, and wood pulp. Because of the abundance of its resources, the high quality of its products, its MFN tariff advantages, and its geographic proximity, Canada will continue to be the major supplier of these products to the US market indefinitely.

Asian countries -- South Korea, Taiwan, Japan, and the Philippines -- annually supply most (more than 90%) of the plywood imported by the United States. Because of the US preference for plywoods from tropical hardwoods, this market also is virtually closed to the USSR. Less than 10% of the plywood imported into the United States is from birch -- a wood that is abundantly available in the USSR; established suppliers in Finland and Canada can meet US needs adequately.

Exports

The USSR is the world's fifth leading exporter of timber products (after Canada, the United States, Sweden, and Finland). Exports reached a peak of about \$830 million in 1970, of which about 70% was coniferous lumber and logs.

In 1970, 44% of Soviet exports of timber products, by value, went to the Communist countries (mostly to Eastern Europe) and 56% to non-Communist countries. Exports to the United States were insignificant, consisting of only a small quantity of plywood. Japan and the United Kingdom, the chief non-Communist customers, accounted for 18% and 11%, respectively, of Soviet exports.

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Soviet Interest in Foreign Assistance

An agreement for the joint exploration of Soviet forests is already in force between the USSR and Japan. Japan is supplying machinery and equipment for a forestry exploitation project in the Soviet Far East valued at about \$130 million and is taking mainly logs in payment. Japan and the USSR currently are negotiating an additional ten-year agreement, valued at about \$350 million, for the delivery of wood chips and pulpwood for the Japanese pulp and paper industry. As in the earlier agreement, Japan would provide the machinery and equipment for the wood processing facilities in the USSR. Discussions are also in progress between Finland and the USSR for Finnish aid in at least three forestry development projects -- two near the Finnish border and a much larger one in Siberia. A French firm is supplying the equipment for a joint pulp and paper project valued at \$100 million in which the firm will take payment in deliveries of pulp over a three-year period. The French firm also has signed a contract for additional purchases of part of the pulp produced by the Soviet plant over the succeeding fifteen years. Canadian officials also have had talks with Soviet representatives about forestry development.

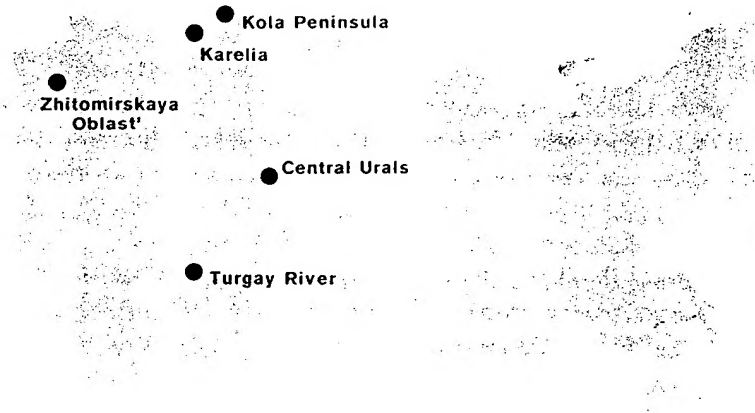
Premier Kosygin's recent call for a Soviet-US joint venture was the first indication of Soviet interest in US help for the development of Soviet timber resources.

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Titanium



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Resources

The USSR claims to have "inexhaustible" reserves of titanium-bearing ores, most of which consist of ilmenite and titaniferous magnetites. Reserves of rutile are limited. Rutile is the principal low-cost mineral used for making titanium in non-Communist countries.

The most important Soviet deposits of ilmenite are located in the easily accessible areas of the Dnepr-Donets valley in the Ukraine and the Turgay region of Kazakhstan. Titaniferous magnetites are found in the Urals, Karelia, and the Kola Peninsula. Geological surveys currently are being conducted along the Baltic Sea and the Sea of Azov to identify and define new sand deposits to enlarge reserves of rutile.

Production

The USSR is the world's largest producer of titanium sponge, the crude metal that requires further processing into ingot metal. The industry has grown rapidly since the mid-1950s, and the output of titanium sponge in 1970 is estimated at 19,000 tons, about 25% greater than US production for that year. Total capacity of the three Soviet sponge plants is at least 30,000 tons. At one time, the Soviets discussed the construction of new titanium facilities in East Siberia that would increase production to about 50,000 tons by 1980. However, no information is available on these or any other long-range plans for the industry.

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Exports

The USSR exports titanium sponge chiefly to Japan, the United States, West Germany, and France. In 1970 the Soviets exported about 5,000 tons of titanium sponge, of which about 900 tons were sold in the United States. Exports of titanium sponge to Japan and Western Europe amounted to about 2,500 tons. The Soviets now are attempting to increase their exports of titanium sponge. In late 1970, for example, the Soviets engaged in contract negotiations with US firms for the export of titanium sponge and were willing to sign a five-year contract for any amount the US firms specified, at prices considerably below the US producers' price. Before 1970 the USSR had specified a maximum limit of 5,000 tons per annum in its negotiations with the United States. The willingness of the USSR to sell such large amounts of titanium sponge suggests that final demand for titanium in the Soviet economy has not kept pace with production of titanium sponge in recent years.

Market Conditions

World capacity for the production of titanium is likely to be more than adequate to meet demand in the near future. The United States, Japan, and the USSR account for most of the world production of titanium sponge. At present, only six countries use significant amounts of titanium -- the United States, Japan, the USSR, the United Kingdom, West Germany, and France. The United States, the world's largest consumer of titanium, has been using about 20,000 tons of titanium sponge per year. Future US demand for titanium, which earlier had been estimated at about 50,000 tons per annum by 1975, was predicated, in large part, on a large production program for the US supersonic transport (SST). Each aircraft would have required about 400 tons of titanium. With the cessation of the SST program, and the slowdown in aerospace production generally, US demand for titanium sponge has fallen off sharply. Two of the three major American producers of titanium sponge recently shut down their production facilities. The US Bureau of Mines estimates that US production of titanium sponge in 1971 will drop at least one-third compared with 1970. The decreased US demand may, in turn, cause a cutback in production of titanium sponge in Japan and the United Kingdom, both suppliers of titanium sponge to the United States.

Soviet Interest in Foreign Investment

Premier Kosygin has suggested a Soviet-US joint venture for the development of Soviet titanium resources. This proposal is surprising in view of the established position of the USSR as the world's largest producer of titanium sponge and a competent fabricator of titanium products.

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However, the USSR may be concerned about the adequacy of its reserves of raw materials for long-range needs and may be seeking US technology for the processing of titanium-bearing ores.

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